



Work Session

PLANNING COMMISSION AGENDA
Thursday, March 20, 2014
Following Regular Planning Commission Meeting
Conference Room 1

Call to Order

Adopt Agenda

New Business

1. Wind Generators and Solar Energy Systems

Adjourn



Planning Commission Work Session

1.

Meeting Date: 03/20/2014

Subject: Wind Generators and Solar Energy Systems

From: Scott Harlicker, Planner

INTRODUCTION

Staff is proposing a new section, Section 11-1600 Alternative Energy Systems and regulations governing wind powered generators and solar energy systems.

ACTIONS

N/A

60 DAY RULE

N/A

LOCATION

N/A

DISCUSSION

Background

At the request of the Sustainability Commission and City Council, staff has been working on drafting regulations governing the installation of wind powered generators and solar energy systems. To accommodate these regulations staff is proposing the establishment of a new section, Section 11-1600 Alternative Energy Sources and Systems. This section can be amended to include future regulations governing other alternative energy systems such as geothermal. The proposed code language is based on research and information provided by the Green Step Cities program, the American Planning Association, and similar codes in other municipalities.

I. Wind Powered Generators or Wind Energy Conversion Systems

At the November 21st meeting staff presented the the draft of the ordinance. The Commission had a variety of comments and questions and postponed action on the proposed ordinance to a workshop. The ordinance includes three sections - Purpose, Permitting Process and Performance Standards. The performance standards section is further divided into standards for all zoning districts and standards for residential, commercial and industrial districts.

The parameters addressed by the proposed ordinance include the following:

- Abandoned and unused towers
- Access standards
- Appearance
- Electrical standards
- Ground clearance
- Lighting

- Maintenance
- Noise
- Overall height
- Permitting process
- Setbacks
- Signage
- Generator Capacity

Proposed Code

Below is a list of sections of the code including Commission comments on that section

Abandoned Towers

The regulation on abandoned towers is similar to those governing cell towers. Abandoned or unused generators must be removed within 12 months of cessation of operation. There was a comment regarding the length of time until a tower is considered abandoned; a 90 day time period was suggested. One year was proposed because it is the same as commercial cell towers. The need for a bond was also suggested to ensure removal. The proposed code includes a removal process whereby an abandoned tower will be deemed a nuisance, the city can act to abate the nuisance and assess the property.

Access

No climbing apparatus may be located within 12 feet of the ground. There was a comment that a fence around the tower should be made a requirement. There was also a general discussion regarding security and safety around both building and ground mounted systems. Generally roof or building mounted systems have access controlled via a locked door. The requirement that a no climbing apparatus can be within 12 feet of the ground limits the ability to climbing a ground mounted tower. Having ground clearance heights of 10 to 15 feet ensures that no one will be hit by a rotating blade.

Appearance

Towers must be of a mono pole design, white or grey with a matte or dull finish. The question was raised if the standards also apply to building mounted towers. The colors can apply to building mounted towers, however, requiring mono pole design on structures will cause problems because most structures can not accommodate such as design, and the height of the tower is limited. Another question relating to appearance was if the guy wires be marked. Marking the wires would draw attention to them and is not that desirable.

Electrical Code

Towers and generators must comply with all applicable electric and building codes. Compliance with the electrical code, as well as other construction/installation related codes is covered with the building permit review. The ordinance can be changed so that it specifically lists the type of engineer needed to sign off on specific areas.

Ground Clearance

The minimum distance between the ground and the blade is 15 feet. The minimum distance is measured from the tip of the blade to the ground. No specific clearance is required for a roof mounted generator because it will be in a secured location. Adding a required clearance will increase the height of the tower to accommodate the added clearance.

Lighting

No lighting is allowed except as required by the FAA.

Vibration

Vibration will be addressed as part of the structural engineer's review and building permit process.

Maintenance

Towers and generators must be kept in good repair and free from rust, damaged supports or other components.

Noise

Towers and generators must comply with current noise standards.

Overall Height and Setbacks

Overall height is measured from the ground to the highest point of the blades. The maximum height varies depending on the zoning district. In residential districts the maximum height is 60 feet, in commercial it is 60 feet and industrial it is 100 feet. Height is also controlled by the setback requirement. Generators must be setback from all property lines at least 1.1 times the overall height. For roof mounted generators the maximum height is 15 feet measured from the point on the roof where the tower is attached and is applicable in all zoning districts. The required setback will limit what parcel can have a ground mounted generator. Most single family residential lots are not large enough to accommodate the required setback. The required setback, 1.1 times the height of the tower, is the same for all districts. No additional setbacks from wetlands, parks or conservation areas are proposed. Towers are not allowed in the Mississippi River Overlay District, therefore, setbacks from bluffs are not an issue.

Permitting Process

Generators are allowed only as an accessory structure or use and require a building permit. In addition to the typical information required in a building permit, generators require information specifically for the tower. The additional information is similar to that required for a cell tower. In addition to the building permit, building and ground mounted generators require a conditional use permit in a residential district; in commercial and industrial districts building mounted generators are a permitted use and ground mounted generators require a conditional use permit. Neither building nor ground mounted generators are allowed in Overlay or Special Districts.

Signage

No signage is allowed except to require warning and identification signs.

Generator Capacity

Staff is proposing a maximum size generator of 50KW. By most codes this size generator is considered a small system. A 50 KW generator would produce enough electricity to meet the needs of a small to medium size commercial, institutional or industrial operation. Typically a 5-15 KW generator is needed to meet the needs of a single family home.

II. Solar Energy Systems

Attached is the proposed solar energy code. The proposed code, like the wind generator code, includes sections for Purpose, Permitting Process and Performance Standards. It also includes an Administrative Variance section. Solar energy systems will be a permitted accessory structure and use, will require a building permit but no zoning permits. Solar energy systems are allowed in all zoning districts and must comply with setback and location requirements for the district in which it is located. Maximum height for a ground mounted system is 15 feet and for a roof mounted system it is the maximum height requirement of the district in which it is located. An administrative variance procedure is included to allow variances to aesthetic, setback and height requirements to permit a property owner to meet minimum design thresholds.

RECOMMENDATION

N/A

Attachments

Solar Ordinance

Wind Generator Ordinance

Chapter 11-1600
Alternative Energy Sources and Systems

11-1602 Solar Energy Systems (SES)

11-1602.1 Purpose. Regulations governing solar energy systems are established to encourage opportunities for the generation of renewable solar energy in appropriate locations, while ensuring compatibility with surrounding land uses, promoting the safe, efficient and effective use of solar energy conversion systems, and protecting the public health, safety and welfare.

11-1602.2 Permitting Process.

- (1) SES are only allowed as an accessory structure or use.
- (2) All SES require a Building Permit. In addition to the general application information required as part of the Building Permit, the applicant must submit the following:
 - (a) A scaled horizontal and vertical (elevation) drawings. The drawings must show the location of the system on the building, or on the property for a ground-mount system, including all structures, property lines, easements, power lines and setbacks to property lines.
 - (b) Pitched-roof-mounted Systems; For all roof-mounted systems, other than a flat roof, the elevation drawings shall show the highest finished slope of the solar collector and the slope of the finished roof surface on which it is mounted.
 - (c) Flat-roof-mounted Systems: For flat-roof applications a drawing shall be submitted showing the distance to the roof edge and any parapets on the building and shall identify the height of the building on the street frontage side, the shortest distance of the system from the street frontage edge of the building, and the highest finished height of the solar collector above the finished surface of the roof.
 - (d) A written certification from a licensed structural engineer that the structure has the structural integrity to carry the weight, wind loads of the SES.
 - (e) An analysis from a licensed engineer showing how the SES must be designed, constructed and operated in compliance with applicable federal, state and local laws, codes, standards and ordinances.
 - (f) Utility Notification: No grid-intertie photovoltaic system shall be permitted until evidence has been given to the Inspections Department that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

11-1602.3 Performance Standards. All SES are subject to the following performance standards:

(1) Certification. Solar energy systems shall be certified by Underwriters Laboratories, Inc. and the National Renewable Energy Laboratory, the Solar Rating and Certification Corporation or other body as determined by the Building Official. The City reserves the right to deny a building permit for proposed SES deemed to have inadequate certification.

(2) Aesthetics. All SES shall be designed to blend into the architecture of the building or be screened from routine view from public right-of-ways other than alleys. The color of the SES is not required to be consistent with other roofing materials. Reflection angles from collector surfaces shall be oriented away from neighboring windows when possible.

(a) Building Integrated Photovoltaic Systems – Building integrated photovoltaic systems shall be allowed regardless of whether the system is visible from the public right-of-way, provided the building component in which the system is integrated meets all required setbacks for the district in which the building is located.

(b) Solar Energy Systems with Mounting Devices – Solar Energy Systems using roof mounting devices or ground-mount SES shall not be restricted if the system is not visible from the closest edge of a public right-of-way other than an alley. Roof mounted systems that are visible from the nearest edge of the right-of-way shall not have the highest finished pitch more than five (5) percent steeper than the roof pitch on which the system is mounted, and shall be no higher than 12 inches above the roof.

(c) Coverage - Roof or building mounted SES, excluding integrated systems, shall not cover more than 80% of the south facing or flat roof upon which the panels are mounted, and shall be setback from the roof edge by a minimum of one (1) foot. The surface area of a pole or ground mounted system shall not exceed half the footprint of the principal structure.

(3) Feeder lines. The electrical collection system shall be placed underground within the interior of each parcel. The collection system may be placed overhead near substations or points of interconnection to the electric grid.

(4) Easements. Solar energy systems shall not encroach on public drainage, utility, roadway or trail easements.

(5) Setbacks. Ground-mounted SES including any appurtenant equipment must meet the accessory structure setback requirement and placement limitations for the district in which it is installed. Roof-mounted systems shall not extend beyond the exterior perimeter of the building on which the system is mounted. Exterior piping for hot water systems shall be allowed to extend beyond the perimeter of the building on a side yard exposure.

(6) Height. Roof-mounted solar energy systems shall comply with the maximum height requirements in the applicable zoning district. Ground-mounted solar energy systems shall not exceed 15 feet in height when oriented at maximum tilt.

(7) Commercial. All SES shall be limited to the purpose of on-site energy production, except that any additional energy produced above the total onsite demand may be sold to the operator's regular electrical service provider in accordance with any agreement provided by the same.

(8) Abandoned or Unused Systems. All abandoned or unused SES must be removed within 12 months of the cessation of operations unless an extension is approved

by the Director. If an extension is not approved, such SES will be deemed a nuisance and the city may act to abate such nuisance pursuant to Chapter 8-1100. After removal, the owner or operator must restore the site to its original or an improved condition.

11-1602.4 Administrative Variance. Where the standards in Sections 11-1602.3(2), (5) and (6) cannot be met without diminishing, as defined below, the minimum reasonable performance of the SES, an administrative variance may be sought from the Director. An administrative variance shall be granted if the administrative variance standards are met.

(1) Minimum Performance Design Standards – The following design thresholds are necessary for efficient operation of an SES.

(a) Fixed Mount Solar energy Systems – Solar Energy Systems must be mounted to face with 45 degrees of south (180 degrees azimuth)

(b) Solar Electric (photovoltaic) systems must have a pitch that is within 20 degrees of latitude, a pitch of between 20 and 65 degrees

(c) Solar Hot Water Systems – Solar collectors need to be mounted at a pitch between 40 and 60 degrees.

(2) Standards for an Administrative Variance – A variance shall be granted if the applicant demonstrates that the following safety, performance and aesthetic conditions are met.

(a) Safety Conditions – All applicable health and safety standards are met.

(b) Ground Mounted Systems – Pole mounted or ground mounted SES must be set back from the property line by one foot and shall not encroach on public drainage, utility, roadway or trail easements.

(c) Aesthetic Conditions – The SES must be designed to blend into the architecture of the building or be screened from routine view from public right-of-ways other than alleys to the maximum extent possible while still allowing the system to be mounted for efficient performance.

Definitions

Active Solar Energy System - A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.

Building-integrated Solar Energy Systems - An active solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include but are not limited to photovoltaic or hot water solar energy systems that are contained within roofing materials, windows, skylights, and awnings.

Building-mounted Solar Energy System - A solar energy system affixed to a principal or accessory building

Freestanding Solar Energy System - A solar energy system with a supporting framework that is placed on, or anchored in, the ground and that is independent of any building or other structure. Garages, carports or similar structures that incorporate building-integrated or building-mounted solar energy systems shall not be classified as freestanding solar energy systems and shall instead be subject to regulations governing accessory structures.

Grid-intertie Solar System - A photovoltaic solar system that is connected to an electric circuit served by an electric utility company.

Photovoltaic System - An active solar energy system that converts solar energy directly into electricity.

Solar Collector Surface - Any part of a solar energy system that absorbs solar energy for use in the system's transformation process. The collector surface does not include frames, supports, and mounting hardware.

Solar Energy System - A set of devices whose primary purpose is to collect solar energy and convert and store it for useful purposes including heating and cooling buildings or other energy-using processes, or to produce generated power by means of any combination of collecting, transferring, or converting solar-generated energy.

Chapter 11-1600
Alternative Energy Sources and Systems

11-1601 Wind Energy Conversion Systems (WECS)

11-1601.1 Purpose. Regulations governing wind energy conversion systems are established to encourage opportunities for the generation of renewable wind energy in appropriate locations, while ensuring compatibility with surrounding land uses, promoting the safe, efficient and effective use of wind energy conversion systems, and protecting the public health, safety and welfare.

11-1601.2 Permitting Process.

(1) WECS are only allowed as an accessory structure or use.
(2) All WECS require a Building Permit. In addition to the general application information required as part of the Building Permit, the applicant must submit the following:

(a) Scaled schematic drawings and photographic perspectives showing the structure and placement of the WECS.

(b) A survey showing all structures, property lines, easements, power lines and setbacks to property lines.

(c) A written certification from a licensed structural engineer that the structure has the structural integrity to carry the weight, wind loads and vibration of the WECS.

(d) An analysis from a licensed engineer showing how the WECS must be designed, constructed and operated in compliance with applicable federal, state and local laws, codes, standards and ordinances.

(e) A written certification from a licensed engineer confirming that the WECS is designed to not cause electrical, radio frequency, television and other communication signal interference.

(f) Utility Notification: No grid-intertie WECS shall be permitted until evidence has been given to the Inspections Department that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

11-1601.3 Performance Standards. All WECS are subject to the following performance standards:

(1) All Districts

(a) No more than one WECS is permitted on any one lot.

(b) WECS must not be located in any drainage or utility easement.

(c) WECS must be equipped with both a manual and automatic braking device capable of stopping the WECS operation in high winds.

(d) No climbing apparatus can be located within twelve (12) feet of the ground.

(e) Ground mounted towers must be of a monopole design.

(f) WECS must be an unobtrusive color and finish such as off white or grey and a matte or similar dull finish.

(g) All ground mounted WECS must be setback from all property lines at least 1.1 times the total height of the WECS.

(h) The minimum distance between the ground and the vertical length of any extensions such as the rotor blades must be fifteen (15) feet.

(i) Building mounted WECS must not exceed a total height of fifteen (15) feet.

(j) The structure upon which a proposed WECS is to be mounted must have the structural integrity to carry the weight, wind loads and vibrations of the WECS.

(k) The total rated capacity of a WECS must not exceeding fifty (50) kilowatts.

(l) Noise. WECS must comply with the noise standards contained in Chapter 11-1206.1

(m) Lighting. WECS must not be illuminated by artificial means, except where specifically required by the Federal aviation Administration or other state or local regulations.

(n) Signage. Advertising or identification on any kind on WECS is prohibited, except for applicable warning and equipment information signage.

(o) Maintenance. All WECS must be kept in good repair and free from rust, damaged supports, framework or other components.

(p) Electrical Wires. All electrical wires associated with a ground mounted WECS must be located within the tower and underground.

(q) Abandoned or Unused Towers. All abandoned or unused WECS must be removed within twelve (12) months of the cessation of operations unless an extension is approved by the Director. If an extension is not approved, such WECS will be deemed a nuisance and the city may act to abate such nuisance pursuant to Chapter 8-1100. After removal, the owner or operator must restore the site to its original or an improved condition.

(2) Residential Districts and Uses.

(a) Building and ground mounted WECS may be allowed as a conditional use, subject to the provisions of chapter 11-304.3 and 11-305.

(b) The maximum total height of a ground mounted WECS is sixty (60) feet.

(3) Industrial and Uses.

(a) Building mounted WECS are allowed as a permitted accessory use.

(b) Ground mounted WECS may be allowed as a conditional use, subject to the provisions of chapter 11-304.3 and 11-305.

(c) The maximum total height of a ground mounted WECS is one-hundred (100) feet.

(4) Commercial and Office Districts and Uses.

(a) Building mounted WECS are allowed as a permitted accessory use.

(b) Ground mounted WECS may be allowed as a conditional use, subject to the provisions of chapter 11-304.3 and 11-305.

- (c) The maximum total height of a ground mounted WECS is sixty (60) feet.
- (5) Overlay and Special Districts. Building and ground mounted WECS are prohibited in all Overlay and Special Districts.

Definitions

Wind Energy Conversion System (WECS) – A device, such as a wind generator, along with associated control or electronics and support structures, that convert wind energy to electrical energy with a total rated capacity not exceeding fifty (50) kilowatts. The device must be a single system designed to supplement other electricity sources as an accessory use to existing buildings or facilities, wherein the power generated is used primarily for onsite consumption.

Wind Energy Conversion System, Total Height – The highest point, above ground level, reached by a rotor tip or any other part of the WECS, or, on building mounted systems, measured from the point where the system is attached to the building.